




Section 4: Analyze Phase/Box 4


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Learning Objectives

- List the major Box 4 Gap Analysis activities for the A3 format
- List the major DMAIC activities in Analyze:
 - Generate potential root causes
 - Prioritize potential root causes
 - Identify analyze phase quick win opportunities
 - Prepare gate review
- Explain the critical role played by the Analyze phase/GAP Analysis in process improvement






Box 4: Gap/Root Cause

1	4	7
2	5	8
3	6	9

- What is/are the root cause(s) of the problem?
- Tools utilized to show cause-and-effect relationship:
 - 5 Why's
 - Fishbone Diagram

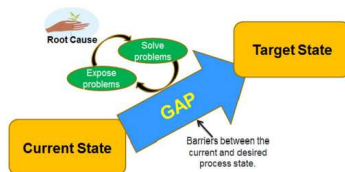


The Importance of the Gap Analysis

- The information derived from the Gap Analysis is key to revealing the top priority barriers or issues that prevent achievement of the desired Target State
- An incomplete or poorly executed Gap Analysis increases the risk of project failure due to not uncovering the true root cause



Gap Analysis




Box 4: Gap Analysis

Box 4: Gap Analysis		
Problem Statement	Direct Cause	Root Cause
Hiring Packets rejected by HR	Packets incorrectly filled out	Hiring managers don't understand what info is need
Process Status unknown by customer	Hiring process is managed within HR	No visual management & regular communication for customers
Vacancies are unfilled for long periods of time	Hiring service does not understand necessary timelines for hiring staff	<ul style="list-style-type: none"> Hiring services do not proactively anticipate staff needs based on turnover rates, retirements Org. policy doesn't allow for posting positions over recruitment website

NOTES:

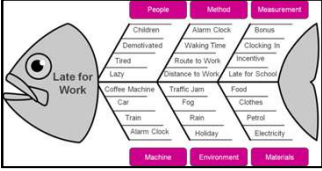

- This part is messy, be patient
- Most challenging and important Box, what separates this process from "Firefighting"

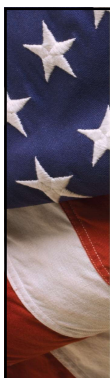




Fishbone or Cause & Effect Diagram


- Visually displays the many potential causes for a specific problem or effect
- Captures different ideas on the problem's root causes
- Utilized to stimulate a team's brainstorming abilities

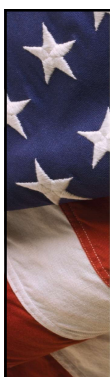





5 Why's Tool


- An iterative question-asking tool to uncover the root cause of a problem
- Applying the 5 Why's:
 - For each problem: Ask Why did this problem occur?
 - Continue asking "why" until you can't go any further (either it stops making sense or you can't impact the answer)
- Often repeating steps 1-2, up to 5 times, will lead to the root cause
 - Why's are seldom linear. If there are 2 potential reasons, explore both of them






Step One: Define the Problem

Clearly defining a problem is critical. Only after a problem is completely understood is the team in the best possible position to solve the problem.




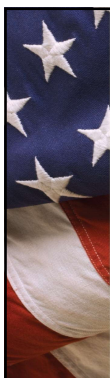


Step two: Identify the Root Cause of the Problem

Identify the root causes of the problem.

You may also discover other problems which you were unaware of.

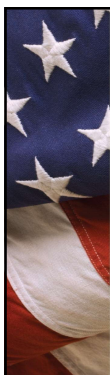




5 Why

A tool to help Identify the root cause of a problem

1. **Why did the robot stop?**
The circuit has overloaded, causing a fuse to blow.
2. **Why is the circuit overloaded?**
There was insufficient lubrication on the bearings, so they locked up.
3. **Why was there insufficient lubrication on the bearings?**
The oil pump on the robot is not circulating sufficient oil.
4. **Why is the pump not circulating sufficient oil?**
The pump intake is clogged with metal shavings.
5. **Why is the intake clogged with metal shavings?**
Because there is no filter on the pump.



Step Three:

Brainstorm Possible Solutions.

Keeping the data and root causes of the problem in mind when brainstorm potential solutions.

Remember the basic rules of brainstorming:

- Keep it moving quickly
- Piggy backing is encouraged

Find out what other organizations in similar situations have done.




Step Four:
Select the Best Solution

Think about the possible consequences of your solution, including what else will be affected

Make sure that your selected solution will produce the desired results








Step Five:
Implement the Plan

Develop a schedule of when each step will be finished

Set up measures and determine how progress will be monitored






The Plan

15

Action #	Issue	Action	Efforts	Owner	Date	Result/Comments
1	Public Design/Response	Design and create 30-second version of Ganges	1M	John D. George	25 Sep 15	Completed
2	Public Design/Response	Design and create 30-second version of Ganges	1M	John D. George	25 Sep 15	Completed
3	Public Design/Response	Design and create 30-second version of Ganges	1M	John D. George	25 Sep 15	Completed
4	Public Design/Response	Design and create 30-second version of Ganges	1M	John D. George	25 Sep 15	Completed
5	Public Design/Response	Design and create 30-second version of Ganges	1M	John D. George	25 Sep 15	Completed
6	Public Design/Response	Design and create 30-second version of Ganges	1M	John D. George	25 Sep 15	Completed
7	Public Design/Response	Design and create 30-second version of Ganges	1M	John D. George	25 Sep 15	Completed
8	Public Design/Response	Design and create 30-second version of Ganges	1M	John D. George	25 Sep 15	Completed
9	Public Design/Response	Design and create 30-second version of Ganges	1M	John D. George	25 Sep 15	Completed
10	Public Design/Response	Design and create 30-second version of Ganges	1M	John D. George	25 Sep 15	Completed
11	Public Design/Response	Design and create 30-second version of Ganges	1M	John D. George	25 Sep 15	Completed
12	Public Design/Response	Design and create 30-second version of Ganges	1M	John D. George	25 Sep 15	Completed
13	Public Design/Response	Design and create 30-second version of Ganges	1M	John D. George	25 Sep 15	Completed
14	Public Design/Response	Design and create 30-second version of Ganges	1M	John D. George	25 Sep 15	Completed
15	Public Design/Response	Design and create 30-second version of Ganges	1M	John D. George	25 Sep 15	Completed




Step Six:
Follow Up / Monitor Progress


Follow-up with the problem, even if it seems to have been solved. Make sure that the problem doesn't come back or that other things have happened as a result.

Update Manuals, communicate changes

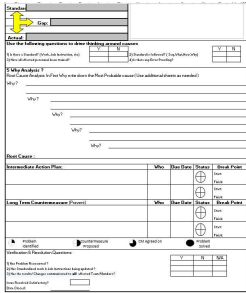
Cross tell


- Internally
- Externally (if allowed)






5 Why Work Sheet







Jefferson Memorial

- [Jefferson Memorial Example](#)



Thomas Jefferson Memorial
District of Columbia






Classic 5 Why Example:

Problem Statement: One of the monuments in Washington D.C. is deteriorating.

- Why is the monument deteriorating?
A: Because harsh chemicals are frequently used to clean the monument.
- Why are harsh chemicals needed?
1. To clean off the large number of bird droppings on the monument.
- Why are there a large number of bird droppings on the monument?
1. Because the large population of spiders in & around the monument are a food source to the local birds.
- Why are swarms of insects drawn to the monument at dusk?
1. Because the lighting on the monument in the evening attracts local insects.


Root Cause


Solution: Change how the monument is illuminated in the evening to prevent attraction of swarming insects.



Benefits of the 5 Whys:


- Identifies the root cause of a problem
- Determines the relationship between different root causes of a problem
- Can be learned quickly & doesn't require statistical analysis
- Can be adapted and applied to most any problem
- Can challenge assumptions and uncover how much people really know about a process

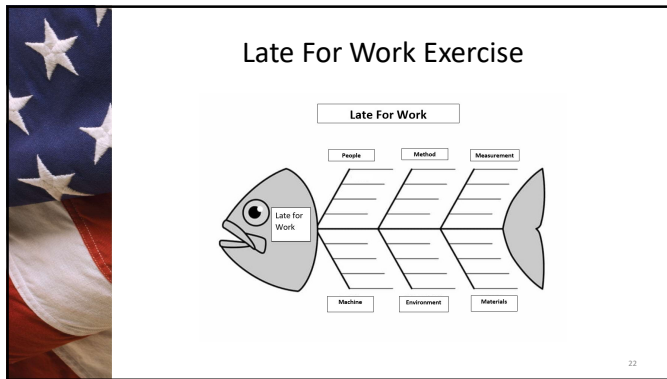


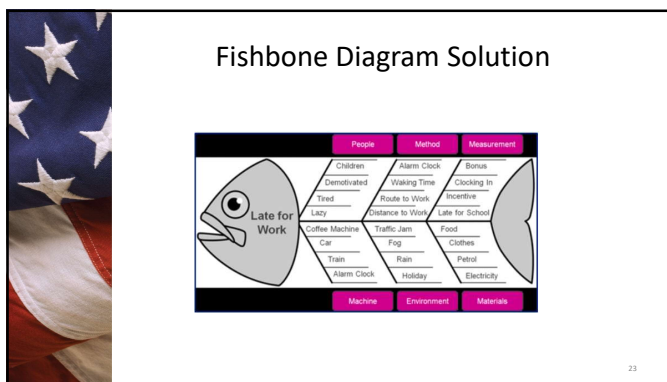


Exercise: Creating a Fishbone Diagram (20 min.)

- Write a problem statement in the head of the "fish" (Late for work)
- Silently brainstorm all possible causes of that problem. 1 cause post-it
- Categorize all issues from each member into major categories & align with major bones
- Place causes that correlate with each category on small bones
- Color code causes







Exercise: Complete Box 4 in A3 Formatting (15 min.)

- In your small groups:
 - Take your top 3 – 4 high prioritized problems & use your identified root causes from the Fishbone or 5-Whys exercise to write a Gap Analysis, indicating problem statement, direct cause, and root cause.

Box 4. Gap Analysis		
Problem Statement	Direct Cause	Root Cause



Analyze/Box 4 Gap Analysis Deliverables

- Updated project Charter
- List of potential root causes
- Validated root causes
- Prioritized list of root causes
- Completed Box 4: Gap Analysis or Analyze Gate Review